



Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (PCR A)

EPD program

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List of abbreviations

EPD	Environmental Product Declaration (EPD)
LCA	(Environmental) Life Cycle Assessment
Kiwa-EE	Kiwa-Ecobility Experts
PCR	Product Category Rules
PCR A	Part A of the Product Category Rules: General product categorisation rules for construction products
PCR B	Part B of the Product Category Rules: EPD requirements for specific product categories.
SVA	unabhängiger Sachverständigenausschuss (en: independent committee of experts)

1 General information

According to ISO 14025, product category rules are the combination of specific rules, requirements, or guidelines used to create an Environmental Product Declaration for one or more product categories. In the Kiwa-EE program, the PCR is divided into two parts: General Product Category Rules (PCR A) and specific Product Category Rules (PCR B). The first one contains the uniform life cycle assessment calculation rules for all construction products, as well as the requirements for the project report.

According to the general program instructions, Kiwa-EE has a focus on construction products. This includes raw materials for building materials, components / elements, prefabricated parts, building supplies, technical building equipment and packaging materials.

The specific PCR regulates the specific requirements of each product subgroup for the contents of an EPD.

This document is based on the following standards:

- ISO 14025:2011-10: Environmental labels and declarations - Type III environmental declarations - Principles and procedures

- EN 15804+A2¹: 2019: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN ISO 14040:2006+A1:2020 Environmental management – Life cycle assessment – Principles and framework
- EN ISO 14044:2006 Environmental management – Requirements and guidelines

In principle, Core PCR EN 15804 and PCR A as well as specific PCR B or standardised PCR (if available) shall be applied to all Kiwa-EE EPDs.

2 Scope of application

This document defines the calculation rules according to EN 15804 for the life cycle assessment as well as the specifications for the project report. According to EN 15804, for every Environmental Product Declaration an additional project report shall be provided.

3 Project report specifications

In accordance to EN 15804 the project report is a systematic and comprehensive

¹ For better readability, "EN 15804+A2: 2019" will always be abbreviated to EN 15804 in the further course of the document.

summary of the project documentation supporting the verification of the EPD. It contains all relevant information on which the life cycle assessment is based on.

The project report is intended to record the LCA based information and additional information as declared in the EPD to fulfill the requirements of the relevant standards. The project report is disclosed to the verifier. Since this document contains internal, secret and not publicly accessible data and information, this is done under utmost confidentiality. The project report is not intended for public communication.

The structure of the project report should correspond to the scientific approach of a life cycle assessment. The contents should include at least the information specified in EN 15804 (section 8.2).

4 Aim and target group

According to ISO 14040, the goal of the life cycle assessment shall be defined. The following information shall be provided:

- reasons to conduct the study
- intended application
- addressed target group (business-to-consumer or business-to-business communication)

5 Scope of the study

5.1 Product description

The technical and functional specifications for the product shall be described.

Products can be declared either by manufacturers or groups of manufacturers:

- a specific product from one plant,
- a specific product averaged from several plants,
- as well as an average product from one plant and
- an average product averaged from several plants

The averaging shall consider the production volume of the plants in the reference year.

Manufacturer groups may also declare a specific or an average product. The environmental declaration shall clearly indicate which of the above-mentioned EPD types is involved. Averaging shall be transparent and described in the product information.

5.2 Application

The technical application of the product shall be described. It shall be stated what the intended use is and how/where the product is used.

5.3 Declared unit or Functional unit

The term "functional unit" may only be used if the entire life cycle of the

construction product is considered. For all other cases, the term "declared unit" applies.

The results of the life cycle assessment are to be related to the declared unit defined in the specific product category rules (PCR B). The conversion factor to mass per declared unit shall be provided in the EPD and project report. The conversion factor shall be used for the development of scenarios, for example for transport and end-of-life scenarios.

5.4 System boundaries

The system boundaries shall be specified according to the modular structure according to EN 15804: The life cycle stages A1 to A3 (manufacturing phase) + modules C and D shall be specified as mandatory (EPD Type: "cradle-to-gate + modules C and D") with the following exception.

Products and materials that:

- are physically integrated with other products during installation so they cannot be physically separated from them at end of life, and
- are no longer identifiable at end of life as a result of a physical or chemical transformation process, and
- that do not contain biogenic carbon.

If modules C1 to C4 and module D are not declared this decision shall be justified.

Optionally further modules and life cycle stages can be specified (cradle-to-gate + modules C and D with options). For a cradle-to-grave EPD, the complete life cycle of the product shall be considered (A1-A3, A4-A5, B1-B7, C1-C4 and D).

For all life cycle phases the provision of all materials, auxiliary material, products and energy as well as the complete waste treatment up to the end of the waste status or disposal of residual waste shall be considered. Losses (loss of material during transport, disposal of packaging, etc.) shall also be taken into account.

5.4.1 Manufacturing phase (mandatory) (A1 – A3):

The manufacturing phase includes:

- A1 Raw material extraction and processing of secondary input materials (e.g., recycling processes)
- A2 Transport to manufacturer
- A3 Production

For secondary materials or derived fuels as input, the system boundary between the investigated and the preceding system is defined. The system boundary of the preceding system is reached from the complete waste treatment [according to the European Waste Framework Directive] (see EN 15804 section 6.3.5. and Annex B). Flows leaving the system in the

manufacturing phase shall be treated as co-products.

This includes:

- Production waste that is reused or recycled. The materials can be re-used during the manufacturing phase (closed loop) or can leave the system as co-products (open loop).
- Heat and electricity from the energy recovery of production waste. The energy can be used during the production phase (closed loop) or it can leave the system as a co-product (open loop).

If debits and credits are allocated to the co-products, these may not be specified in module D, but to the corresponding module which they occur. The manufacturing phase may be specified as declared module A1-A3.

5.4.2 Construction phase (optional) (A4 – A5)

The construction phase includes:

- A4 Transport to construction site
- A5 Installation in the building

5.4.3 Use phase (optional) (B1 – B7)

The use phase includes:

- B1 Use or application of the built-in product
- B2 Maintenance

- B3 Repair
- B4 Replacement
- B5 Renewal
- B6 Energy input for the operation of the building (e.g., operation of a heating system and other building services equipment)
- B7 Use of water for the operation of the building

5.4.4 Disposal phase (mandatory) (C1 – C4):

The disposal phase includes:

- C1 Dismantling, demolition
- C2 Transport for waste treatment
- C3 Waste treatment for reuse, recovery and/or recycling
- C4 Disposal

Depending on the disposal scenario, this phase can begin with the dismantling or demolition of the building. The dismantled products are initially regarded as waste. If the following criteria are met, they can be defined as secondary materials:

- recovered substances, products or components that are commonly re-used for specific purposes
- an economic value can be assigned to the recovered material
- the recovered material meets the technical requirements for the intended re-use and complies with existing legislation and standards

- when reused, harmful effects on the environment and human health are to be excluded (limit values for pollutants from the respective valid legislation)

The system boundary to module D shall be drawn when the full waste treatment has been completed.

5.4.5 Benefits and burdens outside the life cycle (mandatory) (D)

The following credits shall be indicated in accordance with EN 15804

- D Reuse, recovery and / or recycling potentials, indicated as net flows and credits (benefits)

Information module D is intended to provide transparency about environmental benefits or burdens for disposal scenarios of substances and products.

5.4.6 Energy mix

The electricity mix shall be calculated according to the geographical and temporal system boundaries. Where green electricity is used, certificates shall be verified over the entire validity period of the EPD. CO₂ certificates are not taken into account.

5.4.7 Criteria for the exclusion of inputs and outputs and their application

The cut-off criteria shall not be used to hide data. All inputs and outputs for which data are available shall be considered in

the calculation. Data gaps can be filled with conservative assumptions of average data or generic data. Any such assumption shall be documented.

All flows contributing to more than 1% of the total mass, energy or environmental impact of the system shall be included in the life cycle assessment. In total, the selected cut-off processes shall not contribute more than 5% to the impact categories considered. Material and energy flows that may lead to significant environmental impacts must not be cut off. The cut-off criteria applied must be documented in the project report.

6 Life Cycle Inventory

The life cycle inventory shall be carried out in accordance with ISO 14044 and EN 15804. Data collection and calculation procedures shall be documented in the project report.

6.1 Data selection

The following rules apply:

In general, specific data collected from specific production processes or average data derived therefrom shall have priority in the calculation of environmental impacts.

The choice of the generic data and background data should be documented (data base, literary source etc.). There are no

restrictions on the choice of database, as long as you comply with the data quality requirements. The documentation format shall follow the current ILCD format and nomenclature.

Name of the (background) data record, its source (data base, literary source etc.).

The data collection should also include the data quality issues:

- Assessment period for each module considered in the Life Cycle Assessment (e. g. one year average, etc.)
- Appropriateness of background data (temporal, geographical, technological)
- Other assumptions concerning background data, e.g. about data gaps
- Omissions of life cycle stages, processes
- Assumptions regarding energy and electricity production incl. year of reference. It should also be transparent which electricity/energy model is applied as avoided product if energy recovery is included in the optional Module D.
- Assumptions concerning other relevant background data where relevant for the system boundary

6.2 Data quality

Further the data quality requirements are defined as following:

- Manufacturer-specific data may be a maximum of 5 years old, generic data a maximum of 10 years old.
- Process-specific data shall be based on the average of an operating year.
- Data records shall be complete and consistent. Deviations shall be justified.
- Time period of 100 years, in case of landfill scenario longer if relevant
- Technical background complies with physical reality
- Integrity of generic data records, system limit and cut-off criteria for generic data records validity demonstrated

The generic data shall be specified with the background database and the reference year of the database. The data quality assessment information shall cover at least the following elements:

- time-related coverage;
- geography coverage;
- technology coverage

The data quality assessment must cover at least 80% of each core impact.

6.3 Allocations

Generally, the allocation rules according to EN 15804 (section 6.4.3) are to be applied.

6.3.1 Co-product allocation

Allocations occur as soon as co-products occur in the investigated system. Co-products are products that occur in addition to the desired outputs and can be reused in other processes. The distribution of environmental impacts between product and co-product is called allocation. In principle, allocations should be avoided as far as possible (e.g. by system expansion, splitting processes into sub-processes). In general, the principle applies that allocation should be based on the main purpose of the process. If an allocation shall be made, the following points should be considered:

- Allocation shall be based on physical properties (e.g. mass, volume) when the difference in revenue from the co-products
- In all other cases allocation shall be based on the economic value
- Material flows carrying specific inherent properties (e.g. energy content) elementary composition, shall always be allocated reflecting their physical flows, irrespective of the allocation chosen for the process

6.3.2 Allocation procedures of reuse, recycling and recovery

For the reuse, recycling and recovery of products, the system boundary is set where the outputs have reached the state of complete waste treatment. If the system boundary is not left in module A1 - A3, the credits and debits achieved will be reflected in module D.

The relevant allocations shall be stated, at least:

- Allocation for the use of recycled material or secondary raw materials
- Allocation of energies, auxiliary materials and operating materials to the individual products of a plant,
- credits from the recycling and/or thermal recovery of packaging materials and production waste
- credits from the recycling and/or energy recovery of the deconstructed product.

Reference shall be made to the modules in which the allocations are made.

6.4 Information on biogenic carbon content

The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate and must be declared separately for the product and for each associated packaging.

If the total mass of biogenic carbon containing materials is less than 5 % of the total mass of the product and associated packaging, the biogenic carbon content may be omitted.

6.5 Representation of unit processes

The modelling of the life cycle assessment shall be illustrated by the presentation of the unit process. This can be done in tabular form or as a screenshot of the LCA model. The following points shall be considered:

- Assignment of company data to the data sets used
- Assignment of the process data to the life cycle stages

6.6 Comparability of environmental declarations

For the assessment of comparability, the information specified in EN 15804 paragraph 5.3 shall be included. In order to inform the user about the comparability of products, the EPD shall contain the following statement:

" In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804. For the evaluation of the comparability, the following aspects have to be considered in particular:

PCR used, functional or declared unit, geographical reference, definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). For further guidance see EN 15804+A2 (5.3) and ISO 14025 (6.7.2)"

7 Parameters of the Life Cycle Inventory (LCI) and Life Cycle Impact Assessment (LCIA)

The calculation can be done manually or with the help of LCA tools (webapplication, software, table sheets, etc). There is no default LCA tool as long as the calculations comply with ISO 14025 and ISO 14040.

The results of the Life Cycle Impact Assessment shall be presented in tabular form for all modules in the project report and in the EPD. The impact assessment of the LCA shall include the potential environmental impacts to describe the use of resources, waste and other outputs as well as the potential environmental impacts. The information is provided for the following indicators:

Table 1: Core environmental indicators according to EN 15804+A2

Parameter	Abbr.	Unit
Depletion of abiotic resources - mineral and metals	ADP-mm	kg Sb-eq.
Depletion of abiotic resources - fossil resources	ADP-f	MJ
Acidification potential	AP	mol H+ eq.
Global Warming Potential total	GWP-total	kg CO ₂ -eq.
Global Warming Potential from fossil carbon	GWP-f	kg CO ₂ -eq.
Global Warming Potential from biogenic carbon	GWP-b	kg CO ₂ -eq.
Global Warming Potential from land use and land use change	GWP-luluc	kg CO ₂ -eq.
Eutrophication potential terrestrial	EP-t	mol N eq.
Eutrophication potential freshwater	EP-f	kg PO ₄ eq.
Eutrophication potential marine water	EP-m	kg N eq.
Depletion potential of the stratospheric ozone layer	ODP	kg CFC 11-eq.
Tropospheric ozone formation potential	POCP	kg NMVOC-eq.
Water depletion potential	WDP	m ³

Table 2: Additional environmental impact indicators according EN 15804+A2

Parameter	Abbr.	Unit
Human toxicity potential, cancer effects	HTP-c	CTUh
Human toxicity potential, non-cancer effects	HTP-nc	CTUh
Ecotoxicity potential freshwater	ETP-fw	CTUe
Potential soil quality index	SQP	-
Particulate matter emissions	PM	Disease incidence
Ionising radiation, human health	IRP	kBq U235 eq.

Table 3: Parameters describing the use of resources according to EN 15804+A2

Parameter	Abbr.	Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ, lower calorific value [Hi]
Use of renewable primary energy resources used as raw materials	PERM	MJ, lower calorific value [Hi]
Total use of renewable primary energy resources	PERT	MJ, lower calorific value [Hi]
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ, lower calorific value [Hi]
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ, lower calorific value [Hi]
Total use of non-renewable primary energy resources	PENRT	MJ, lower calorific value [Hi]
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ, lower calorific value [Hi]
Use of non-renewable secondary fuels	NRSF	MJ, lower calorific value [Hi]
Use of net fresh water	WDP	m ³

Table 4: Parameters describing waste categories and additional output flows according to EN 15804+A2

Parameter	Abbr.	Unit
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Components for further use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy	EE	MJ, lower calorific value [Hi]

Table 5: Information describing biogenic carbon content at factory gate according to EN 15804+A2

Parameter	Abbr.	Unit
Biogenic carbon content in product	-	Kg C
Biogenic carbon content in accompanying packaging	-	Kg C

According to EN 15804, reference must be made to the disclaimer for the declaration of core and additional environmental impact indicators.

For all indicators mentioned above, the characterisation factors of the Joint Research Center (JRC) of the European Commission (EC) have to be applied. The characterisation factors are available at the following internet link: <https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml> (last accessed on 16.06.2021).

Characterization factors and elimination of long-term emissions are applied for >100 years.

There are no statements to be made about endpoints of impact categories, exceedances of threshold values, safety margins or risks. The indicators declared in the information modules of the life cycle of a product A1 to A5, B1 to B7, C1 to C4, and module D, may not be added up in any combination of the individual information modules to a sum or partial sum of the phases of the life cycle A, B, C, or D. As an exception, modules A1, A2, and A3 may be added together.

In principle, other indicators and environmental information can also be declared. Both in the text and in the tables, a clear separation between indicators and parameters prescribed according to EN15804 and additional indicators shall be evident.

The results tables can be presented according to two variants:

- Variant 1: Indicators describing resource use and environmental information derived from life cycle inventory (LCI): Parameters describing resource use + Environmental information describing waste categories + Other environmental information describing different waste categories + Environmental information describing output flows + Biogenic carbon information. Within the table, no assignment of the previously mentioned categories has to be declared, as long as the indicators / parameters listed above are concerned.
- Variant 2: Impact assessment: Core indicators for environmental impact + additional indicators according to EN 15804 + further indicators (voluntary). Within the table, an assignment to the three categories shall be given.

8 Additional information

For products that are in contact with indoor air during the use phase after their

installation in the building, the EPD shall provide information on health-relevant use scenarios in the building:

- Emissions to indoor air, according to the general standards on the measurement of the release of regulated substances from construction products with harmonised test methods as specified by the relevant European Product Standardisation Technical Committees, where available.

For products that are in contact with soil and water during the use phase after their installation in the building, the EPD shall inform about use scenarios related to soil and water pollution:

- Release to soil and water, according to the general standards on the measurement of the release of regulated substances from construction products with harmonised test methods according to the specifications of the respective European Product Standardisation Technical Committees, where available.

9 Interpretation

Conducting an interpretation and discussion of the LCIA is only required for the project report. However, this does not need to be included in the EPD document.

For interpretation, the aggregation variables of the Life Cycle Inventory and the impact assessment indicators are to be discussed in the project report by means of a dominance analysis related to the declared unit, stating specifications that have a significant influence on the result. The following points should be addressed:

- results
- the relationship between Life Cycle Inventory results and impact assessment results

- assumptions and limitations regarding the interpretation of results in the EPD, both methodological and data related

- assessment of data quality

The description of the deviation from the average of the impact assessment results is not necessarily a quantitative statement; it may also be a qualitative statement in the sense that the deviation from the declared average is large or small.

10 Normative references

- ISO 14025 Environmental labels and declarations - Type III environmental declarations - Principles and procedures (ISO 14025:2006); German and English version EN ISO 14025:2011
- ISO 14040 Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006 + Amd 1:2020); German version EN ISO 14040:2006 + A1:2020
- ISO 14044 Environmental management - Life cycle assessment - Requirements and guidance (ISO 14044:2006)
- ISO 14067 Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification (ISO/DIS 14067:2017); German and English version EN ISO 14067:2017
- ISO/TS 14071 Environmental management - Life cycle assessment - Critical review processes and assessor competencies: Supplementary requirements and guidance to ISO 14044:2006 (ISO/TS 14071:2014); German and English version CEN ISO/TS 14071:2016
- EN 15804 Sustainability of construction works - Environmental product declarations - Basic rules for the product category construction products; German version EN 15804:2012+A2:2019
- CEN/TR 15941 Sustainability of construction works - Environmental product declarations - Methods for selection and use of generic data; German version CEN/TR 15941:2010
- ISO/IEC 17065 Conformity assessment - Requirements for bodies certifying products, processes and services (ISO/IEC 17065:2012); German and English version EN ISO/IEC 17065:2012

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